

REMARKS

Claims 1-15 are pending in this application. Claims 1-7 have not been amended. New claims 8-15 recite further embodiments of the instant invention. Support for new claim 8-15 can be found as follows:

- claim 8: Table 1
- claim 9: Specification, p. 34, ll. 6-7
- claims 10 and 11: Specification, p. 33, ll. 7-9
- claims 12 and 13: Specification, p. 36, ll. 8-12
- claims 14 and 15: Specification, p. 32, l. 24-p. 33, l. 1

The claim amendments do not present new matter or raise new issues. In view of the preceding amendments, the applicants respectfully request reconsideration of the above-identified application

The Claimed Invention

In brief, claims 1-15 recite an aqueous coating agent that can be applied as primer coating agents used to modify the surface of plastic films made of polyester resin, polypropylene resin, and polyamide resin to impart excellent adhesion. In particular, claim 1 recites, among other limitations, a polyurethane resin with 15 to 35 wt% aromatic content, and polyester and polyether polyols limited to 20 to 50 wt% aromatic content and liquidity at room temperature.

Hydrophobic polyester and/or polyether polyols which are **liquid at room temperature** is important:

The present inventors have intensely studied so as to achieve the above objects and found that film forming properties during the application at comparatively low temperature can be improved and good film forming properties can be obtained in the off-line coating . . . By using a polyester polyol or polyether polyol having an aromatic cyclic structure in the molecule as the polyester polyol or polyether polyol which is **liquid at normal temperature**, adhesion to a polyester film could be improved.

(Specification, p. 10, ll. 8-22) (emphasis added).

The present inventors have further studied so as to solve the problem and found that good film forming properties and heat resistance do not deteriorate by the use of a polyester

polyol, which itself has no water dispersibility but has hydrophobicity, as the polyester polyol having an aromatic cyclic structure, which is **liquid at normal temperature** and is to be added in a water dispersion, even when the amount to be added in the water dispersion is small.

(Specification, p. 11, ll. 17-24) (emphasis added).

In addition, the claimed aromatic content for polyether and polyester polyols results in improvements in film forming properties, adhesion, and other features. (Specification, Table 1, p. 49; Tables 3-1, 3-2, p. 58-59).

Claim Rejections – 35 U.S.C. §103(a)

In the Office Action, claims 1-3 and 5-7 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,194,487 to Jacobs, in view of U.S. Patent No. 5,308,914 to Wallon, et al.

The applicants respectfully traverse this rejection. **Jacobs** and **Wallon**, combined, fail to disclose the claimed invention because the references do not disclose a polyurethane resin with 15 to 35 wt% aromatic content, and polyester and polyether polyols limited to 20 to 50 wt% aromatic content and liquid phase at room temperature.

First, **Jacobs** fails to disclose a polyurethane resin with 15 to 35 wt% aromatic content, as recited in claim 1:

Wherein the water-dispersible polyurethane resin (A) . . . also contains 15 to 35% by weight of an aromatic cyclic structural unit based on the weight of the water-dispersible polyurethane resin (A).

(Claim 1).

Jacobs does not explicitly disclose any aromatic wt% content for the polyurethane resin based on the total content of the polyurethane resin. In the Office Action, it was asserted that **Jacobs** discloses “the urethane/urea group content to be between 9 and 20% by weight of the polyurethane.” (Office Action, p. 3). However, this disclosure has no relevance to the aromatic content defined in the claimed invention. Accordingly, **Jacobs** fails to disclose the recited

polyurethane aromatic structural unit content of 15 to 35 wt% based on the weight of the polyurethane resin.

Second, **Wallon**, which was cited for the disclosure of polyester and polyether polyols, fails to disclose **polyester and polyether polyols that are liquid at room temperature and have an aromatic content of 20 to 50 wt%**.

Claim 1 requires “hydrophobic polyester polio (B-1) and/or hydrophobic polyether polio (B-2) [that] . . . contain **20 to 50% by weight of an aromatic cyclic structural unit.**” In fact, the examples in the Specification show that further limiting the aromatic content of the polyester to 25.2 wt% and 34.8 wt% resulted in unexpected improvements in film forming properties, adhesion, and other features. (Specification, Table 1, p. 49; Tables 3-1, 3-2, p. 58-59). Furthermore, claim 1 requires hydrophobic polyester and/or polyether polyols that are **liquid at room temperature**.

In the Office Action, **Wallon** was cited for the disclosure of “an aqueous dispersion containing a polyurethane and an adhesion improving polymer . . . including polyethers . . . [and] polyesters.” (Office Action, p. 2, ll. 9-11).

However, **Wallon**’s general disclosure of polyethers and polyesters fails to explicitly disclose the claimed polyethers and polyesters. There is no specific mention at all in **Wallon** of polyethers with **any particular aromatic content or phase**. Furthermore, given that **Wallon** fails to disclose any polyethers or polyesters in the Examples, there is simply no disclosure in **Wallon** that supports polyester and polyether polyols that are liquid at room temperature.

In addition, the claimed aromatic content and liquid phase of polyether and polyester polyols are not inherent in **Wallon**. In the Office Action, it was asserted that **Wallon** discloses polyesters prepared from terephthalic acid and isophthalic acid and, therefore, this would result in polyesters with approximately 30 wt% of aromatic content:

If the polyester is prepared from phthalic acid or isophthalic acid ([Wallon,] col. 3, lines 11-12). If the polyester is prepared from phthalic acid or isophthalic acid ([Wallon,] col. 3, line 68) and butanediol ([Wallon,] col. 4, line 10), the aromatic content is approximately 30% by weight.

(Office Action, p. 3, ll. 12-14). However, this inference cannot necessarily be made because **Wallon** describes that polyesters can be prepared from aliphatic materials, such as maleic acid, other than aromatic materials, and hydrophobic polyethers or polyesters are not incorporated in the Examples of **Wallon**. Therefore, **Wallon** does not teach the hydrophobic polyester polyol (B-1) and the hydrophobic polyether polyol (B-2) that are liquid at room temperature and that include 20-50wt% aromatic cyclic structural unit, as recited in claims 1-7.

As for the phase of the polyols, contrary to the claimed invention, **Wallon** implicitly teaches polyethers that are **solid at room temperature**. **Wallon** describes that the polyethers usually have a K value of from 20 to 50 in DMF at 25°C according to DIN 53,726:

The polyethers are, for example, polyethylene oxide, polypropylene oxide or polytetrahydrofuran. The polyethers usually have a K value of from 20 to 50 in DMF at 25°C. according to DIN 53,726.

(Wallon, col. 5, ll. 63-66). In addition, **Wallon** describes that the products (i.e. polyester) usually have a viscosity of from 1,000 to 6000, in particular from 2,000 to 4,000 mpa · s at 150°C.

(Wallon, col. 6, ll. 21-23). Therefore, those skilled in the art would conclude from **Wallon's** disclosure that the polyethers of **Wallon** are **solid state at room temperature**.

Accordingly, given **Wallon's** failure to disclose any kind of aromatic content for the polyethers and polyesters, or whether they are liquid at room temperature, **Wallon** is not specific enough to disclose the polyether and polyester of the claimed invention.

Third, there is absolutely no motivation to combine **Jacobs** and **Wallon**.

Jacobs describes a water dispersible polyurethane resin, and discloses that "suitable polyols

which may be used as additives in accordance with the present invention to **improve the gloss of coatings** . . . are polyols which may contain **ether groups**.” (**Jacobs**, col. 2, ll. 39-44). On the other hand, **Wallon** teaches adding polymers to water dispersible polyurethanes to **improve adhesion**. (**Wallon**, Abstract). There is absolutely no suggestion in either reference that additives which improve coating gloss also improve adhesion and, therefore, one can substitute for the other. Therefore, no motivation exists to import the polyethers of **Wallon** to the teachings of **Jacobs**.

Furthermore, no motivation exists to import the polyester teaching of **Wallon** to **Jacobs**' polyurethane resin. As discussed above, **Jacobs** only suggests adding polyethers to polyurethane resin to improve coating gloss, but does not mention polyesters. In the absence of any mention of polyesters, there is no reason for one skilled in the art to combine the polyesters of **Wallon** with the polyurethane of **Jacobs**.

Moreover, in light of **Jacobs**' disclosure that higher molecular weight polyols are not preferred, those skilled in the art would not have been motivated to combine high molecular weight polyols with **Jacobs**' coating composition. **Jacobs** discourages using, as additives in a coating composition, higher molecular weight ether group-containing polyols:

The higher molecular weight ether group-containing polyols are less preferred as additives for the coating compositions of the present invention because even though they improve the gloss of the resulting coatings, either the storage stability of the coating compositions or some of the other properties of the resulting coatings are not as good as those obtained from the preferred low molecular weight polyols.

(**Jacobs**, col. 2, ll. 61-68). In fact, **Jacobs** describes polyols having a molecular weight of 62 to 1000, preferably 120 to 250, and the examples thereof are of low-molecular-weight polyols. (**Jacobs**, col. 2, ll. 44-58). While **Wallon** does not explicitly mention a range of molecular weight of the adhesive-improving polymer when the polymer is a polyether or polyester, the reference states that “[t]he products usually have a viscosity of from 1,000 to 6,000, in particular from 2,000 to 4,000, mpa s at 150°C.” (**Wallon**, col. 6, ll. 20-22). Therefore, the inherent disclosure of **Wallon** is a polyether

with a higher molecular weight, given that polyethers with a viscosity of from 1,000 to 6,000, in particular from 2,000 to 4,000, mpa s at 150°C are high molecular weight products. That is, **Wallon** fails to inherently teach the claimed polyols, as well as explicitly disclose the claimed polyols.

Therefore, because **Jacobs** describes that higher molecular weight polyols are not preferred, those skilled in the art would not have combined the high molecular weight polyols of **Wallon** with **Jacobs'** coating composition.

Furthermore, in new claims 14 and 15, the number average molecular weight of the hydrophobic polyol (B) is preferably within a range from 200 to 4000, and more preferably within a range of 250 to 2000. (Claims 14-15).

In summary, **Jacobs** and **Wallon** fail to render the claimed invention obvious for failing to disclose polyurethane resin with the claimed aromatic content; claimed polyether and polyester polyols with the claimed aromatic content and liquid phase at room temperature; and for the absolute lack of motivation to combine the references. Accordingly, the applicants respectfully request that this rejection of claims 1-7 be reconsidered and withdrawn.

In the Office Action, the Examiner rejected claim 4 under 35 U.S.C. §103(a) as being obvious over Jacobs, in view of Wallon and U.S. Patent No. 3,960,983 to Blank.

The applicants respectfully traverse this rejection for the same reasons as above. In particular, **Blank** was cited for the disclosure of "polyether polyols . . . prepared from bisphenolic monomers and alkylene oxides such as propylene oxide." (Office Action, p. 4). However, like **Jacobs** and **Wallon**, **Blank** fails to disclose polyurethane resin with the claimed aromatic content; claimed polyether and polyester polyols with the claimed aromatic content and liquid phase at room temperature; and does not provide any motivation to combine **Jacobs** and **Wallon**. Therefore, the combined disclosure of **Jacobs**, **Wallon**, and **Blank** fail to render

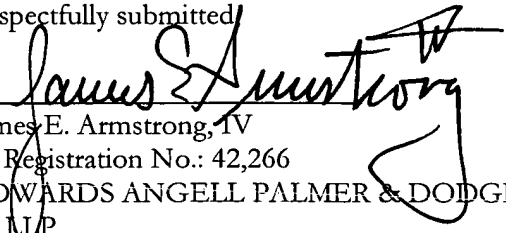
obvious the claimed invention recited in claim 4. Accordingly, the applicants respectfully request that the rejection of claim 4 be reconsidered and withdrawn

In view of the above amendment, applicant believes the pending application is in condition for allowance.

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Respectfully submitted

By


James E. Armstrong, IV

Registration No.: 42,266

EDWARDS ANGELL PALMER & DODGE
LLP

P.O. Box 55874

Boston, Massachusetts 02205

(202) 478-7375

Attorneys/Agents For Applicant